

Meteors.—A large number of stations report many meteors from the 10th to the 15th. The following only are of interest: Albany, Or., the night of the 13th and 14th, unusual meteoric display, brightest since 1833. Louisville, Ky., 6th, very brilliant meteor at 10 p. m., moved from E. to W. with widening trail and increasing brilliancy; duration 3 minutes. Chattanooga on the 10th, leaving trail of yellow light. Visalia, Cal., on the 7th, brilliant meteor, size of orange, visible 15 seconds. Little Rock, Ark., 9:39 p. m., brilliant, moved from E. to W., color, pale yellow, left trail of 10°.

Sun Spots.—The following record of observations, made by Mr. D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac Office, Washington, D. C.:

DATE— August, 1880.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
7th, 9 a. m....	2	23†	1	3	3	23†	One of the spots very large.
8th, 12 m....	1	2	0	0	1	2	4	25†	Faculae. One of the spots very large.
9th, 5 p. m....	1	7	0	0	1	2	5	32†	
10th, 5 p. m....	0	0	0	0	0	0	5	24†	
12th, 5 p. m....	0	6	0	0	0	6	5	30†	Four of the spots very large.
13th, 5 p. m....	0	10	1	4	0	0	4	36†	Faculae.
14th, 5 p. m....	1	4	0	0	0	0	5	40†	
15th, 4 p. m....	0	0	0	0	0	0	5	40†	
16th, 9 a. m....	0	10	0	0	0	0	5	5†	
20th, 5 p. m....	2	5	3	15	1	4	4	40†	Faculae. Spots probably disappeared by solar rotation.
21st, 5 a. m....	0	0	0	8	0	0	3	30	Faculae.
22nd, 10 a. m....	0	0	1	3	0	0	2	25	Faculae.
23rd, 5 p. m....	0	0	0	15	0	0	2	10	Faculae.
24th, 4 p. m....	0	0	1	5	0	0	1	4	
27th, 8 a. m....	1	5	0	0	0	0	2	10	Spots all small.
28th, 9 a. m....	1	8	0	0	1	5	3	18	Faculae. Many of the spots small.
29th, 1 p. m....	0	8	0	0	0	0	2	20	Faculae.
30th, 8 a. m....	0	0	0	0	0	0	2	20	

† Approximated

Mr. Wm. Dawson, at Spiceland, Ind., reports: 1st, 1 group, 5 spots; 2nd, 1 group, 20 spots; 3rd, 1 group, 35 spots; 4th, 1 group, 25 (?) spots; 5th, 1 group, 25 spots, one spot *seen with naked eye*; 6th, 2 groups, 57 spots, large spot near centre *seen with naked eye*; 7th, 4 groups, 40 spots; 8th, 5 groups, 59 spots; 9th, 5 groups, 33 spots, large spot broken in two; 10th and 11th, 4 groups, 33 spots, large spot united on latter date; 12th, 4 groups, 37 spots, large spot very near W. edge; 13th, 5 groups, 57 spots, new group at E. edge; 14th, 4 groups, 60 spots; 15th, 5 groups, 81 spots, 50 spots in 1 group; 17th, 5 groups, 60 spots; 18th, 4 groups, 55 spots; 19th, 4 groups, 57 spots; 20th, 4 groups, 35 spots, 1 group disappeared by rotation, 1 new group; 21st, 2 groups, 29 spots; 22nd, 2 groups, 46 spots; 23d, 3 groups, 42 spots, large group disappearing; 24th, 2 groups, 9 spots, small group disappearing; 25th, 1 group, 8 spots; 26th, 1 group, 3 spots; 27th, 2 groups, 16 spots, new group 4° E. of centre; 28th, 3 groups, 19 spots, new group at E. edge; 29th, 3 groups, 27 spots; 30th, 2 groups, 20 (?) spots; 31st, 2 groups, 19 spots.

Mr. L. Trowbridge at Waterburg, N. Y., Aug. 1st, group near E. margin appeared by rotation, 1 large spot; 2nd, same group, with 2 spots; 5th, 4 spots, 1 large; 6th, 7 spots, 1 large, with a well defined rectangular umbra; 7th new groups visible, old probably broken, had 6 spots; 9th, old group, 5 spots, new, 1 spot, with a new group further E., all these S. of equator, north of equator, new group near E. margin, all the above appeared by rotation; 10th, 3 groups S. of equator; 11th, 4 groups, 5 spots, same as 9th; 12th, 4 groups; 13th, 4 groups, W. group disappeared by rotation and new one appeared E. of N. group; 14th, 1 new group, 5 groups of 7 spots; 15th, 5 groups, 8 spots; 16th, 5 groups, 11 spots; 17th, 5 groups, 1 with 9 spots; 21st and 22nd, 2 groups near W margin; 23rd, all disappeared by rotation; 24th, 1 faint spot near middle of disk S; 28th, 1 group, 1 spot near E. margin; 29th, 2 groups, 1 new, near W. margin.

Norwalk, Ohio, Mr. C. M. Wilcox, observer, seen daily, except 1st, 25th, 26th, 27th. Morrison, Ill., Mr. Maxwell, observer, 9th, 5 large spots.

NOTES AND EXTRACTS.

The following extracts are from a memoir on *La Lumière Zodiacale*, by P. Marc Dechevrens, S. J., who has made at Zi-Ka-Wei, near Shanghai, China, regular observations of the zodiacal light from September 1st, 1875, to September 1st, 1879:

"The observatory stands in the middle of an immense plain about twenty-five miles from the sea, and in no direction is its horizon broken by the slightest inequality of the country; moreover the observatory is isolated and the few neighboring buildings do not render the air impure or interfere with the most delicate astronomical observations.

GENERAL DESCRIPTION OF THE PHENOMENA.

"When its two branches (the east in morning, the west in the evening) have the same length—not exceeding 80° or 90°—the zodiacal light assumes the same shape on either side of the horizon; it is that of a lance head or of a half lens a little flattened. But when its length reaches 90°, 100° and beyond, it is rather a long band of light of a nearly constant width, whose splendor does not sensibly diminish even to its extremity, which it is frequently difficult to find among the brilliant stars. Sometimes near the horizon the band appears as it were to be enwrapped near its base in an envelope yet more luminous.

"The luminosity (*la lueur*) always appears quite steady and motionless. Its color is always pure white, like to the milky way. I have never observed those red or yellow tints, which others believe they have noticed in higher latitudes. The luminosity, or to speak more exactly, the matter which so shines in the zodiacal zone does not extend itself (*se developpe*) in the plane of the ecliptic; it dominates it (*elle le domine*) in the greater part of its mass; the axis itself does not seem to be absolutely rectilinear; its median part, *the nearest* the sun raises itself a few degrees above the ecliptic, while the two extreme points (principally that of the eastern portion), re-curve and even rest on that plane, at times even sink slightly below it. This fact seems in accord with a certain number of the observations collected by Heis in his *Zodiacallicht-Beobachtungen*.

"The luminosity participates in the apparent diurnal motion of all the stars; this fact has been noticed by all who have observed the phenomena and is opposed to all theories which designate the terrestrial atmosphere as the place of the zodiacal light.

MORE SPECIAL DESCRIPTION OF THE PHENOMENA.

"The general features already described are not derived alone from observations made at Zi-Ka-Wei; they have been admitted by the earliest observers and are generally adopted by all savants."

The following details, undescribed as far as I know by any author, stand forth prominently in the whole series of our observations:

"The two branches of the zodiacal light, the eastern in the morning, the western in the evening, neither appear on nor disappear from the horizon, at the same time; but their maximum of elongation takes place at the same moment.

"The total duration of their appearance is six months for each branch.

"The first luminosity in the east appears in the early days of August and the last dies out at the end of January. On the western side the zodiacal light is first observed about the end of October and entirely disappears only in June.

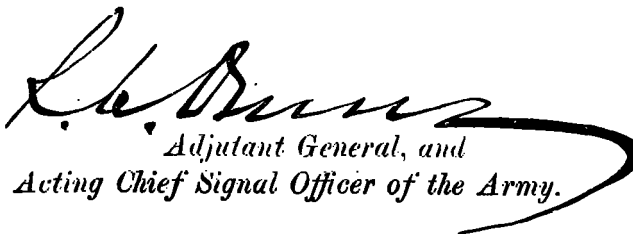
"Thus during November, December and January, in the morning before dawn and in the evening after twilight there can be viewed these two luminous bands among the stars, making in that part of the sky an angle of nearly 60° with the milky way, whose brightness and purity they rival, —especially in parts nearest the sun.

"The eastern branch (in the morning) slowly elongates from its first appearance; on the contrary the western branch (in the evening) rapidly develops and in a month can reach its maximum of elongation. Inverse phenomena prevail in its disappearance, that is to say, the morning luminosity grows faint in a short time after the epoch of its greatest elongation, while, in the evening the opposed luminosity varies very slowly and disappears almost insensibly.

"Owing to doubts expressed by savants regarding isolated observations showing an elongation of 90° and more the following, frequently confirmed by my co-adjutors, are given: 1873, November 28th (morning) 100° ; December 21st (evening) 120° ; 24th (evening) 123° ; 25th (morning) 140° ; the night of December 24th–25th, the phenomena embraced three quarters of the ecliptic. 1877, December 1st, 3rd, 4th and 7th. The band of light reached to the milky way passing between the Pleiades and Aldebaran (nearer the first stars than the latter one); then losing itself in the milky way the luminosity had yet enough brilliancy to cause us to think that it prolonged itself even to the other edge of the starry zone. The sun being then in the 251st degree of longitude the arc of the ecliptic covered by the luminous band was not less than 185° . This observation was made *four* times. A gap, of about 65° separated the morning and evening branches so that the total amplitude was then about 295° . The observations made by M. Eybert, in 1873, (published by Heis of Münster), during a voyage from Buenos Ayres to Cape of Good Hope agree perfectly with these. He noted December 8th (evening) in latitude 20° N. an elongation of 184° , and (morning) the other branch showed an elongation of 176° , so at that time the whole ecliptic was covered by the luminous bands.

"As to the brightness of the two branches, the maximum—not coinciding with the greatest elongation—was observed in November for the eastern and in February for the western branch."

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.


Adjutant General, and
Acting Chief Signal Officer of the Army.

Copy furnished for

Entered at the Post Office at Washington, D. C., as Second-Class matter.

This Paper is furnished by the Government of the United States, without charge, to the Co-operating Observers acting with the Signal Office in the collection of Simultaneous Reports.